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The preceding five tables include all the combinations of two items now presented in any five of the registration states and thus may be regarded as a sort of codification of prevailing practice in American states and cities. They are to be regarded merely as a minimum that should be included in every state and city registration report, and not as precluding the retention or formation of other tables. In fact, a series of desirable supplemental tables will be considered by this Committee for presentation later to the Association and the coöperating agencies (American Public Health Association and Bureau of the Census), but the matter of greatest present importance is to make a beginning, with a few simple yet fundamental tables, the general adoption and practical use of which in state and city reports will pave the way for further progress. If too elaborate a set of tables be recommended at the outset, it is likely that they will not generally be adopted.

As an aid to the execution of this plan, it is suggested that, if the coöperating Committee of the American Public Health Association approve, these standard tables be recommended for adoption as "Rules of Statistical Practice" by the organized registration officials of the country. This will, of course, require action at the next meeting of that Association which will be held at Havana next year, and in the meantime the forms of tables can be scrutinized thoroughly and perhaps some additional tables be recommended.

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*Business Barometers Used in the Accumulation of Money.* By Roger W. Babson. Wellesley, Mass., 1911. 4th ed. Pp. 380.

The modern prophet, whether it be weather, population, or the stock-market that he predicts, sits on a pile of figures: the tripod is obsolete. Statisticians do not announce "laws," and then fit the facts to them; but rather try to deduce principles from the figures. A prediction of the course of the stock or bond market, or of any of its subsidiary phenomena, such as money-rates, possesses much more interest to the general public than a prediction of the growth of population, for the former seems to offer a chance to make money. Mr. Babson's book, which is semi-popular in character, contains, nevertheless, some account of the statistical methods by which, he says, the "major movements" of security prices and money-rates can be foretold, and on these methods some comments suggest themselves.

Current figures on some twenty-five subjects are first collected and tabulated: these figures include statistics of building and real estate, bank clearings, business failures, labor conditions, money conditions, foreign trade, gold movements, commodity prices, stock exchange transactions, crop conditions, railroad earnings, and social conditions. From these a composite index number is made and plotted. On the same diagram a curve showing the course of the average price of "32 leading stocks" is set forth, along with a curve of bond prices and money-rates. There appears to be a remarkable correspondence between the curve of stock prices and the index curve; and, indeed, that might be expected, since all the phenomena included in the index curve influence prices. Moreover, the price of stocks—at least, since 1903—seems to have risen and fallen slightly in advance of the index number: inference, Wall Street discounts the future. How then, are we to discount Wall Street?

At this point, Mr. Babson introduces the reader to "a law under which mechanics, medicine, and other sciences move, namely, that action and reaction are equal." This broad principle he applies as follows: First, the curve of stock prices and the curve showing the course of the index number; then a nearly straight, slanting line is drawn across the diagram, above the base line, and rising toward the right. This line is said to represent the normal progress of the country: let us call it X-Y. Now for our law: since action and reaction are equal, the *area* under the curve of the index number and *above* the line X-Y must be equal to the area *under* the line showing normal progress and included by the index curve, on the average. That is, the index curve rises above and dips below the straight line which represents normal progress. When it has been above for some time, we may expect it to fall below.

How is one to know when the index curve may be expected to drop below normal? The areas under this curve may be long and thin, or short and high, and still be equal. Mr. Babson's answer is that one must watch the "rate of flow."

It is obvious that on the slope of the line which represents the normal expansion of business depends the whole theory of this "equality of areas." Before 1903, the slope of this line was comparatively steep, but at 1903 it became much more gradual, and continued from 1903 to date in a *straight* line in the third edition of Mr. Babson's book, published in 1910; but in the fourth edition the slope had again changed, this time at the beginning of 1907. How is this line located? Mr. Babson says: "If there was any way to locate with mathematical exactness the line of growth, we of course would do so; but . . . economists have been unable to do so. Therefore, as the above is true" (referring to the "law of action and reaction") "and as the outline of our black areas approximately represents actual conditions then *if we locate thereon some line which will make said areas above and below the line of normal growth equal, we are justified in assuming that said line is the line of normal growth.*" This line is "subject to revision each year." (p. 107.) Since this line is drawn so as to *make* the prosperity and depression areas equal, no inference as to the correctness of the "law of action and reaction" seems permissible from the diagram, and none is attempted. But in the note printed on these composite plots, it is said "The line X-Y represents the normal growth of the country's business, the slope being changed whenever there is a change in the trend of conditions as shown by clearings." This might lead one to suppose that the line X-Y and the index curve were based on independent data, and hence that the equality of these areas was strong proof of the "action and reaction" theory on which they were constructed; but of course no such conclusion follows.

On the other hand, such work as this, being pioneer in character, is naturally crude in some respects, but it does at least embody an interesting collection of statistical data on the current condition of business. Sixty-four pages of the book are devoted to a computation of how much money an investor who bought and sold at the right time would have made from 1860 to date,* and fifty-eight pages to a review of financial history, year by year, from 1860.

It is obvious that many more causes influence stock prices than the ones for which figures are used. It is impossible to diagram all the causes. Why not, then, apply the "law of action and reaction" directly to the curve of stock-prices itself? If this law is accurate, it should apply to the curve of security prices, for they are, in the long run, based on expert anticipation of all possible causes for variation in price. And therefore, why is it necessary to construct an elaborate index number? Perhaps, because a diagram of stock prices merely, seems too simple, since most people believe that Wall Street is as hard to harness to a "system" as its running-mate, Monte Carlo, unless it be for the " long swings."

In constructing an index number from such dissimilar elements as immigration, production of gold, idle cars, etc., it is obvious that some of the components should be given more weight than others. Nothing elaborate in the way of weighting is here attempted, bank clearings, domestic money rates and stock market transactions being merely given double weight. This is Mr. Babson's judgment: whether or not this method could be improved by weights based, say, on the correlation coefficient of each component with the stock curve, is an open question.†

Apart from all questions of statistical theory and method, however, there can be no doubt that a system like Mr. Babson's performs a distinct service to merchants and bankers, by enabling them to base extension and curtailment of credits and business ventures on something more than individual judgment. The diagram discussed above is itself a graphic representation of expert opinion of great interest both to statisticians and business men. Books like J. P. Norton's "Statistical Studies in the New York Money Market" (Macmillan, New York, 1902), E. W. Kemmerer's "Seasonal Fluctuations in the Demand for Money and Capital"

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* *cf.* "How Money is Made is Security Investments, or, A Fortune at Fifty-five," by Henry Hall, New York, 1908, pp 71–101.

† *cf.* an article on "The Correlation of Economic Statistics," by Warren M. Persons, in the December, 1910, issue of these Publications.

(Washington, Government Printing Office, 1910), and others, in addition to their value as scientific studies, serve to show that statistical methods applied to sociological questions do not necessarily result in mere academic *tours de force,* but may have an instructive bearing on a practical question of perennial interest, namely, how to make money.

H. A. Richards.